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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,554	02/26/2004	Shintaro Takehara	249304US2S	3247
22850	7590	09/17/2007	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			MUHAMMED, ABDUKADER S	
			ART UNIT	PAPER NUMBER
			2627	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/786,554	Applicant(s) TAKEHARA, SHINTARO	
	Examiner Abdukader Muhammed	Art Unit 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2004 and 18 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6, 8-14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (US 7,102,967 B1).

Regarding Claim 1, Ma et al. teach a disk apparatus for reproducing a disk on which information is recorded by pits or marks with various lengths (regardless of the lengths of pits or marks; see column 6, line 1), comprising: a photodetection unit configured to divisionally detect light reflected by the disk as a plurality of photodetection signals (four photodetector elements A, B, C, and D; see figure 3); and a tracking error signal generation unit configured to generate a tracking error signal on the basis of a phase difference between the plurality of photo-detection signals detected by the photodetection unit (see field figure 3), wherein the tracking error signal generation unit includes: an equalization unit configured to equalize waveforms of the plurality of photodetection signals detected by the photodetection unit (equalizers 306a and 306b; see figure 3). Ma et al. does not distinctly disclose the equalization unit has a gain of not less than 15 dB at a frequency corresponding to a shortest pit or mark and the gain attenuates within a

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frequency band not less than the frequency band not less the frequency corresponding to the shortest pit mark.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the gain of the equalization unit to be not less than 15 dB and the attenuation to be within a band not less the frequency corresponding to the shortest pit mark after routine experiment to discover the optimum range since Ma et al. disclose the general condition for the equalizer having a gain for a frequency close to f_2 and attenuation after f_2 (see column 7, line 63 to column 8, line 3 and also figure 8).

Regarding Claim 2, as applied to claim 1 above, but Ma et al. does not distinctly disclose the equalization unit has frequency-gain characteristics that obtain a gain of not more than -3 dB at a frequency three times the frequency corresponding to the shortest pit or mark.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the gain of the equalization unit to be not more than -3 dB at a frequency three times the frequency corresponding to the shortest pit or mark after routine experiment to discover the optimum range since Ma et al. disclose the general condition as for higher frequencies larger than f_2 , the gain drops due to attenuation (see figure 8).

A Regarding Claims 3 and 4, as applied to claims 1 and 2 above, Ma et al. also teach the equalization unit includes: a high-pass filter (figure 8 shows the reinforcement of the high frequency component for a band of frequency in the vicinity of f_2 , this shows that the equalizer has a high pass filter included within) having frequency-gain characteristics in which a gain is constant within a first frequency range not more than a first frequency, a gain is constant within a second frequency range not less than a second frequency which is more than the first frequency,

and a gain increases in a third frequency band between the first and second frequencies (see figure 8 and also note that this a general characteristic of high pass filters), and a low-pass filter (figure 8 shows attenuation after a certain band of frequency in the vicinity of f_2 , this shows that the equalizer has a low pass filter included within) having frequency-gain characteristics in which a gain attenuates within a fourth frequency band not less than a third frequency (see figure 8 and also note that this a general characteristic of low pass filters).

Regarding Claim 5, Ma et al. teach the limitations claim 4 for the reasons discussed above. Ma et al. differ from the claimed invention in that the first frequency range is a frequency range 0.5 to 1.5 times a frequency corresponding to a pit or mark with which a reproduction signal amplitude saturates, the second frequency range is a frequency range 0.5 to 1.5 times the frequency corresponding to the shortest pit or mark, the third frequency matches the frequency corresponding to the shortest pit or mark, and a Q value of the low-pass filter is not less than 2.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust/modify the frequency ranges to be 0.5 to 1.5 times the frequency corresponding to the shortest pit and the Q factor to be greater than 2 in the system of Ma et al. after routine experimentation to discover the optimum range in order to increase the accuracy of tracking error detection since Ma et al. disclose the general condition for the filter frequencies as shown in figure 8 (note that no new structure is added, rather the optimum characteristics are detailed). Q factor is also a mere mathematical expression that depends on variables such as frequency, resistance and capacitance of the filters. Additionally, it has been held that changes in size and shape of parts of an invention in the absence of an unexpected result involves routine skill in the art. See *In re Dailey*, 93 USPQ 47 (CCPA 1966).

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Regarding Claim 6, as applied to claim 1 above, but Ma et al. does not specifically disclose that the transfer function H of the equalization unit as given in the claim.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to formulate the transfer function as shown in the claim since it is merely a mathematical expression of the characteristics of the filters.

Regarding Claim 8, as applied to claim 1 above, Ma et al. also teach that the gain at the frequency corresponding to the shortest pit or mark is not less than 0 (the gain of the tracking error signal does not vary depending on the lengths of pits or marks; see column 8, lines 28-32 and 38-43).

Regarding Claims 9-14 and 16, method claims 9-14 and 16 are drawn to the method of using the corresponding apparatus, tracking error signal generation unit, claimed in claims 1-6 and 8 with similar limitations. Therefore method claims 9-14 and 16 correspond to apparatus claims 1-6 and 8 and are rejected for the same reasons of obviousness as used above.

4. Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (US 7,102,967 B1) as applied to claims 5 and 13, above, further in view of Nobukuni et al. (US Publication 2001/0053115 A1).

Regarding Claims 7 and 15, Ma et al. teach the limitations of claims 5 and 13 for the reasons discussed above. Ma et al. differ from the claimed invention in that it does not specifically show the ratio of the shortest pit to the pit or mark for which the reproduction signal amplitude saturates is 2:8.

Nobukuni et al. on the other hand teach (1, 7) RLL-NRZI modulation with a mark length of $2T$ for short pits and $8T$ for long pits (see page 1, paragraph [0015], lines 9-10). It would have

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been obvious to one of ordinary skill in the art at the time the invention was made to have used RLL 91, 7) modulation for high density disks since Nobukuni et al. teach that the (1, 7) RLL - NRZI modulation are known as modulation methods for high-density mark length modulation recording (see page 1, paragraph [0015], lines 10-12).

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdukader Muhammed whose telephone number is (571) 270-1226. The examiner can normally be reached on Monday-Thursday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. Customer Service can be reached

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at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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10 September 2007


WAYNE YOUNG
SUPERVISORY PATENT EXAMINER